

REMARKS

The specification has been amended to correct minor typographical errors. Claims 1, 3, 8, 9, 12, 19, and 20 have been amended. Claims 1, 8, 9, 12, 19 and 20 have been amended to further define a SAN architecture and associated storage devices in a non-limiting manner. New claims 21-49 have been added. Claims 1-49 are currently pending in the application.

Claim 3 was rejected under 35 U.S.C. §112¶2. Claim 3 has been amended for proper antecedent basis. Accordingly, the Applicants respectfully request that the rejection of claim 3 under 35 U.S.C. §112 ¶2 be withdrawn.

Selected new claims further define the connectivity between certain elements and call for a general purpose computer that can communicate with another processing system through a Wide Area Network (WAN) and by employing a TCP/IP protocol. Thus, selected new claims further specify the context of a Storage Area Network (SAN) and the relation to a WAN and Internet TCP/IP network communications.

The amendments to claims 1, 3, 8, 9, 12, 19 and 20 and the new claims 21-49 are supported by the application as filed and do not present new matter:

Amendments to claims 1, 19 and 20 regarding SAN. (p. 1, line 16 - p. 3, line 5, Figures 1-2 (describing and illustrating SAN architecture and connectivity between servers and storage devices)).

Amendments to claim 19 regarding an “external” data path engine. (Figure 4; p. 8, line 24 - p. 9, line 27 (data path engine operating in general purpose computer, and coupled to switch network and WAN and thus, “external” and “coupled to” a SAN).

New claims 21, 23, 25 and 41-43. (p. 3, lines 8-12, p. 5, lines 7-11, p. 6, lines 15-17, p. 7, lines 16-21, p. 9, lines 28-31 (describing automated or automatic processing and creating of data path).

New claims 22, 24 and 26. (p. 4, line 26 - p. 5, line 11; p. 9, lines 1-2 (data path may contain multiple channels or threads; fibre channel connections)).

New claims 27-27. (p. 7, lines 18-22 (without user or administrator intervention)).

New claim 30. (p. 9, lines 23-27 (automated discovery)).

New claims 31-40. (p. 9, lines 1-17 (WAN and general purpose computer connections, communicating with another processing system through the WAN using the general purpose computer with, for example, a TCP/IP protocol)).

New claims 44-49 (p. 6, lines 15-17 (across multiple networks and devices)).

I. Claims 1-4, 6 and 20 Are Novel Over Lee.

Independent claim 1, dependent claims 2-4, and 6 and independent claim 20 were rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,601,101 to Lee et al. ("Lee"). A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference MPEP § 2131. The Applicants respectfully traverse the rejection, however, in order to expedite prosecution of the application, the Applicants have amended independent claims 1, 19 and 20 to further define a SAN architecture. Selected dependent claims also call for a WAN and a TCP/IP protocol to further define the relationship between a SAN or a computer that includes a data path engine and a WAN and communications using a TCP/IP protocol. The Applicants respectfully submit that the above amendments and following remarks eliminate Lee from further consideration.

Claim 1 of the subject application recites "[a] method of creating a data path for a process executing on a server coupled to a storage area network (SAN), the SAN providing connectivity between the server and a storage device in the SAN ...". The specification of the subject application further explains that SAN is a relatively new storage architecture that provides connectivity between servers and storage, and that a conventional SAN architecture includes servers, a switching network and a storage infrastructure.

The Lee patent fails to disclose or suggest, and is not at all related to, a SAN architecture. In contrast, the Lee patent describes transparent access to network attached devices by providing hand-off protocols that are transparent to a network client. The described method involves determining in the first device that a handoff should take place, identifying a second device to take over the session, sending handoff messages to and receiving an acknowledgment from the second device, and reporting the handoff to and receiving an acknowledgment from the switch. The devices applying this method may be disk drives, Web servers, or database servers.

Lee also describes Network Area Storage (NAS) as a storage paradigm in which disks are detached from the server and placed on the network. Ideally, the server is removed from the data path between client and data. Lee describes the NAS system (Figure 11) as having a client 1110 that interfaces to the thinserver that is on a plug-in board 1160 in a switch 1140-1160. The client requests pass through level three (L3) 1120 and level two (L2) 1130 software layers. The switch is also connected to a disk 1112 through level two 1132 and level three 1122 software layers, allowing the client to directly access the disk or the thinserver. Switching takes place at the level two 1140 layer. The client believes that it is accessing the thinserver and sends packets to the thinserver's (virtual) IP address. Because the client does not know about the disk, in the switch unit filters and switches packets to the correct destination, a disk or the thinserver. This filtering and switching can be implemented in the switch fabric, in bypass hardware 1150 on a plug-in board, or in software on a plug-in board 1160. (Lee, col. 20, lines 27-46).

Applicants' independent claims 1, 19 and 20, in contrast, expressly refer to a SAN architecture, and are not related to and do not involve a NAS.

The Applicants respectfully submit differences between a NAS and a SAN are clearly evident from other patents that were cited in the Office action. For example, the U.S. Patent No. 6,535,518 to Hu explains that a NAS is a specialized server that is connected to a network. A NAS bypasses servers, so server bottlenecks may be non-existent for NAS systems. Hu explains that a major disadvantage of a NAS is the overhead associated with the network layer(s). Hu further explains that a NAS can be used in secured environments like an internal LAN or SAN. Hu then describes a SAN as an architecture for storage systems and, contrary to NAS, SAN is not limited due to a network interface and defines an environment that is dedicated to storage, and that servers are used to connect the SAN to an outside network. (*Cf.*, Office Action, p. 3, para. 1; Lee, col. 20, lines 31-32; Hu, col. 2, line 32 - col. 3, line 2).

The Applicants respectfully submit that the Office action assertions that column 20, lines 30-32 of Lee discloses a SAN are misplaced since a NAS is not a SAN. Further, Applicants respectfully submit that the Office action assertions are inconsistent with and contrary to the Hu patent, which explains that a NAS and a SAN are in fact different and operate in a different manner. Accordingly, the NAS cited in the Office action is not a SAN. The Applicants

respectfully submit that Lee is fatally deficient and cannot support a rejection under §102 on this basis alone. Moreover, Lee is deficient for various other reasons.

For example, Lee clearly fails to disclose or suggest “parameterizing a set of attributes for a desired data path between the process and the storage device of the SAN as called for by claim 1 or the similar limitation of claim 20. Rather, Lee does not disclose or suggest a SAN or the parameterizing steps involving a SAN.

Moreover, Lee fails to disclose or suggest “constructing the data path that provides said set of attributes” as called for by claim 1 or the related limitations of claims 19 and 20. The Office action asserted that column 18, lines 4-7 as assertedly disclosing the “constructing the data path...” The Applicants respectfully disagree. Lines 4-7 merely explain that when a master server intercept client requests and redirects the request to the appropriate disk, but that such a technique adds overhead by redistributing a client datapath within a master/slave NAS architecture. Nowhere in the cited section is it disclosed or suggested that a data path that provides said set of attributes is constructed or that a data path is constructed in the context of a SAN architecture. Lee is clearly deficient in this regard.

Based on the forgoing amendments and remarks, the Applicants respectfully submit that independent claims 1 and 20 are novel over Lee and respectfully request that the rejection of these claims under §102(b) be withdrawn. Further, the Applicants respectfully submit that dependent claims 2-4 and 6, which depend from and incorporate all of the elements and limitations of independent claim 1 and add novel and non-obvious limitations thereto, are also patentable over Lee.

Additionally, the Applicants respectfully submit that new dependent claims 21, 22, 25, 26, 27, 29, 31, 32, 39, 40, 41, 43, 44, 46, 47 and 49, which depend from and incorporate all of the elements and limitations of respective independent claims 1 and 20 and add novel and non-obvious limitations thereto, are also novel over Lee.

Further, the Applicants respectfully submit Lee does not disclose or suggest the limitations of various dependent claims. For example, new dependent claims 21, 22, 25, 26, 41 and 43 that call for “automatically” constructing a datapath having one or more channels or threads or the one or more channels or threads being “one or more fibre channel connections” in the context of a SAN architecture. That Applicants respectfully submit that Lee clearly fails to

disclose or suggest these limitations.

The Applicants also respectfully submit that Lee also fails to disclose or suggest “constructing the data path that provides said set of attributes being performed without user or administrator intervention” as called for by claims 27 and 29.

The Applicants also respectfully submit that Lee fails to disclose or suggest elements and limitations of claims 1 and 20, and dependent claims 31, 32, 39, 40 and related claims 44, 46, 47 and 49, which specify that the method and apparatus associated with a SAN architecture are distinct and different from a WAN network and TCP/IP protocols and communications.

II. Dependent Claim 5 Is Patentable Over Lee In View of Hu and Nolan.

Dependent claim 5 was rejected under 35 U.S.C. §103(a) as being unpatentable over Lee in view U.S. Patent No. 6,535,518 to Hu *et al.* (“Hu”) and further in view of U.S. Patent No. 6,640,278 to Nolan *et al.* (“Nolan”).

To establish a *prima facie* case of obviousness of a claim under 35 U.S.C. §103(a), all the claim limitations must be taught or suggested by the prior art. All words in a claim must be considered in judging the patentability of that claim against the prior art. MPEP §2143.03. Moreover, there must be some suggestion or motivation to combine the references. MPEP §2143.01. The Applicants respectfully submit that Lee, Hu and Nolan cannot support the rejection in view of these and other requirements and the deficiencies of Lee discussed above.

Claim 5 incorporates all of the elements and limitations of claim 1. The Hu and Nolan references do not cure the previously described deficiencies of Lee and have their own deficiencies.

Further, the Applicants respectfully submit that there is no suggestion or motivation to combine the Lee, Hu and Nolan patents as asserted in the Office action. Lee, as previously discussed, describes transparent access to network attached devices by providing hand-off protocols and a Network Area Storage (NAS). The NAS system has a client 1110 that interfaces to the thinserver that is on a plug-in board 1160 in a switch 1140-1160.

Nolan, in contrast, describes a network that includes an intelligent storage area network (ISAN) server 1200 that provides storage domain management. A storage area network (SAN) can be used to provide data storage services for client computers.

As previously discussed, Hu describes NAS and SAN systems and how they are different. For example, Hu explains that a NAS, as described and used in Lee, is a specialized server, and that the major disadvantages of a NAS are the lack of the flexibility that general servers have and the need to communicate with other servers, and that authorization, account, and authentication (AAA) and firewall are unlikely to be performed by a NAS, since an overly complicated function is not easily implemented in such a system, and that it is not easy to upgrade software or protocols under the specialized design of NAS. (Hu, col. 2, lines 32-59; col. 3, lines 36-37 (object is to maintain flexibility of a server-based system vs a network attached storage or NAS)).

Thus, the Applicants respectfully submit that there is no suggestion or motivation to make the asserted combination of Lee, Hu and Nolan since Lee is not even related to SAN systems. Further, Hu teaches away from the asserted combination since Hu describes the difficulties associated with a NAS (as described by Lee). (Hu, col. 2, lines 32-34; col. 2, line 60 - col. 3, line 2).

Accordingly, the Applicants respectfully request that the rejection of claim 5 under 35 U.S.C. §103(a) be withdrawn.

III. Dependent Claim 7 Is Patentable Over Lee In View of Fairchild.

Dependent claim 7 was rejected under 35 U.S.C. §103(a) as being unpatentable over Lee in view U.S. Patent No. 6,212,560 to Fairchild ("Fairchild"). Claim 7 incorporates all of the elements and limitations of claim 1. The Applicants respectfully submit that Fairchild does not cure the deficiencies of Hu discussed above and has its own deficiencies. Fairchild, like Lee, is not related to SAN architecture as called for by Applicants' claims. Accordingly, the Applicants respectfully request that the rejection of claim 7 under 35 U.S.C. §103(a) be withdrawn.

IV. Claims 8-10, 12 and 18 Are Patentable Over Lee In View of Dobberpuhl.

Dependent claims 8-10, 12 and 18 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lee in view U.S. Patent No. 6,754,718 to Dobberpuhl ("Dobberpuhl"). These claims incorporate all of the elements and limitations of claim 1. The Applicants respectfully submit that Dobberpuhl does not cure the deficiencies of Lee discussed above and has its own deficiencies.

Further, the Applicants respectfully submit that there is no suggestion or motivation to make the asserted combination. Dobberpuhl relates to SAN whereas Lee is not related to SAN and is, instead, related to NAS and providing transparent access to network attached devices by providing hand-off protocols. The required suggestion or motivation, therefore, is lacking. Thus, the Applicants respectfully request that the rejection of claims 8-10, 12 and 18 under §103(a) be withdrawn.

V. Dependent Claims 11 and 13 Are Patentable Over Lee In View of Dobberpuhl and Hu.

Dependent claims 11 and 13 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lee in view of Dobberpuhl and Hu. These claims incorporate all of the elements and limitations of claim 1.

The Applicants respectfully submit that there is no suggestion or motivation to make the asserted combination based on the remarks above, and that Hu teaches away from such a combination. Thus, the Applicants respectfully request that the rejection of claims 11 and 13 under §103(a) be withdrawn.

VI. Dependent Claims 14-18 Are Patenable Over Lee In View of Dobberpuhl and Nolan.

Dependent claims 14-18 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lee in view of Dobberpuhl and Nolan. These claims incorporate all of the elements and limitations of claim 1.

The Applicants respectfully submit that there is no suggestion or motivation to make the asserted combination based on the remarks above. Thus, the Applicants respectfully request that the rejection of claims 14-18 under §103(a) be withdrawn.

VII. Independent Claim 19 Is Patenable Over Nolan in View of Dobberpuhl.

The only remaining rejection is the rejection of independent claim 19 as being obvious over Nolan in view of Dobberpuhl. To establish a prima facie case of obviousness of a claim under 35 U.S.C. §103(a), all the claim limitations must be taught or suggested by the prior art.

All words in a claim must be considered in judging the patentability of that claim against the prior art. MPEP §2143.03. Moreover, there must be some suggestion or motivation to combine the reference. MPEP §2143.01. The Applicants respectfully submit that Nolan and Dobberpuhl cannot support the rejection

Claim 19 calls for an “external” data path engine “coupled to” the SAN...” and other related limitations that refer to an “external” data path engine and the data path engine being “coupled to” the SAN. Nolan clearly fails to disclose or suggest these limitations.

Nolan, in contrast, describes a storage domain management system that includes an intermediate storage server. The intermediate storage server provides on-chassis data storage, storage transaction cache service, storage routing and virtual device management.

The intermediate storage server described by Nolan is in the network, i.e., inside the SAN. The intermediate storage server has client interfaces 1210, 1211, 1212 coupled to client servers 1201, 1202, and 1203, and storage interfaces 1213 and 1214 that are coupled to storage devices 1205, 1206, 1207. In use, client servers requests storage transactions, and the intermediate storage server 1200 maps in the requested transaction to a virtual device, which allocates physical storage for use in the transaction. Thus, communication between the servers 1201-1203 and the storage devices 1205-1207 is provided via a fibre channel arbitrated loop network through the storage server 1200 as an intermediate device. (Nolan, col. 4, lines 63-col. 5, line 45 and Figures 1-3 (describing and illustrating intermediate server inside SAN); col. 5, lines 4-45 (storage server is an intermediate device)).

Considering the description provided by Nolan, it is clear that Nolan does not disclose or suggest various “external data path engine” and “coupled to the SAN” limitations of claim 19 since Nolan merely describes an intermediate server that is integrated within and connected between SAN components. In other words, the intermediate server described by Nolan is inside the SAN and inside the data path. Nolan, therefore, does not disclose or suggest the “external” or “coupled to” a SAN limitations of claim 19 and is, correspondingly, clearly deficient with respect to claim 19.

The Dobberpuhl does not cure these deficiencies and has its own deficiencies. Moreover, the Applicants respectfully submit that there is no suggestion or motivation to make the asserted combination of Nolan and Dobberpuhl.

Dobberpuhl describes a push application 150 that resides on servers 110 in the SAN 100. The push application polls all connections to its respective servers to obtain host attributes and causes host attribute information to be "pushed" down from the server to the storage arrays. After each of the servers 110 within the SAN 100 have sent their host attribute information to the storage array 120, the collected host attribute information allows a processor resident in the storage array or a push application 150 connected within the SAN or a remote GUI 130 connected to a push application 150 connected to a SAN to form a network topology.

As previously discussed, Nolan describes the use of an intermediate server that is in the data path of a SAN. Accordingly, there would be no suggestion or motivation to combine the Nolan and Dobberpuhl patents since the intermediate server of Nolan would conflict with the "push" applications described in Dobberpuhl.

Based on the forgoing amendments and remarks, the Applicants respectfully request that the rejection of claim 19 under §103(a) be withdrawn. Further, the Applicants respectfully submit that new dependent claims 23, 24, 28, 30, 33-38, 42, 45 and 48, which incorporate all of the elements and limitations of independent claim 19 and add novel and non-obvious limitations thereto, are also patentable over Nolan and Dobberpuhl. Further, Nolan clearly fails to disclose or suggest various limitations of new dependent claims.

For example, Nolan fails to disclose or suggest the elements and limitations of dependent claims 31-38, which call for or incorporate limitations calling for a Wide Area Network (WAN) "connecting the SAN to a Wide Area Network (WAN) through a general purpose computer." Nolan, in contrast, describes managing a particular domain. (See, e.g., Figures 1-3).

Further, Nolan clearly fails to disclose or suggest "the external data path engine being operated as part of a general purpose computer" as called for by claim 33. In contrast, Nolan merely describes an intermediate server that is coupled between client servers and storage devices, i.e., inside the SAN. (Nolan, Figures 1-3; col. 5, lines 42-54; col. 6, lines 49-65). Thus, Nolan teaches away from Applicants' claim 33.

Moreover, Nolan does not disclose or suggest and teaches away from "the general purpose computer being connectable to a plurality of other devices, networks or locations through the WAN" as called for by claim 36. In contrast, Nolan describes managing a particular domain with an intermediate server connected between servers and data storage devices inside a

SAN. Similarly, Nolan does not disclose or suggest and teaches away from “constructing a data path across multiple networks” and “constructing a data path across multiple locations” as called for by claims 45 and 48.

VIII. CONCLUSION.

Based on the forgoing amendments and remarks, the Applicants respectfully submit that the application is in condition for allowance and respectfully request that a timely Notice of Allowance be issued in this case. If there are any remaining issues that can be resolved by telephone, Applicants invite the Examiner to contact the undersigned at the number indicated below.

Respectfully submitted,

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